

Woody Biomass Eligibility

Proposed Final RPS Class I Regulation

Department of Energy Resources

April 2012

Eligible Woody Biomass Fuels

Definition: Thinnings and Residues

Forest-Derived Thinnings

- Unacceptable growing stock, managed thinnings

Forest-Derived Residues

- Tops and branches from harvests
- Invasive species

Other Residues

- Forest Salvage (pests, storms – government declared event)
- Non-Forest Residues (wood industry, trimmings, land-use change)

Dedicated Energy Crops

- On non-forest, marginal lands

No Construction and Demolition Material



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Limitations of Forest-Derived Supplies

Forest products harvest and Eligible Biomass Removal is prescribed by Forester in *Eligible Forest Biomass Tonnage Report (Guideline)*.

- Soils within harvest site identified using USDA, NRCS soil maps.
- Poor Soils are identified based on either of the following criteria:
 - 1) Shallow-to-bedrock;
 - 2) Dysic histosols (organic wetland soils, low nutrients, low pH);
 - 3) Dry, nutrient-poor sandy soils

Allowable Biomass removals depend on Soil Conditions

<u>Soil Restrictions</u> (based on USDA NRCS Criteria)	Good Soils	Poor Soils
Percent of Tops and Branches of Forest Products Harvested that must be retained on site	25%	100%
Percent of Weight of Forest Products Harvested that may be removed (as Residues or Thinnings) as Eligible Biomass Woody Fuel	30%	30%

Additional Forest Sustainability criteria must be met on harvest site

- No removals from old growth forest stands, or from steep slopes
- Retention/protection of forest litter, forest floor, stumps/roots
- No removal of naturally down woody material
- Retention of adequate supplies of den trees, snags for ecological needs



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Overall Efficiency

Overall Efficiency – Definition, calculated on a quarterly basis

Overall Efficiency =

[Electric generation not utilized behind-the-meter +
Electric generation utilized behind-the-meter divided by 0.92 (line losses) +
Useful Thermal Energy +
Merchantable Bio-Products]

divided by Biomass Input Heat Content

Overall Efficiency – Eligibility Thresholds

Standard Technology

- 50% for ½ REC value, increasing linearly to a full REC value at 60%

Advancement of Biomass Conversion Technology

- 40% for ½ REC value, increasing linearly to a full REC value at 60%

Advancement of Biomass Conversion Generation Unit

Units that demonstrate advancements in fuel-to-energy conversion, fuel processing, emissions controls. SQAs open for public comment.



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GHG Accounting

Threshold

- 50% reduction in GHG over 20 years, relative to a natural gas, combined-cycle generation unit
- Must be met on an annual basis
- Under-Compliance Mechanism provides some flexibility

GHG Accounting

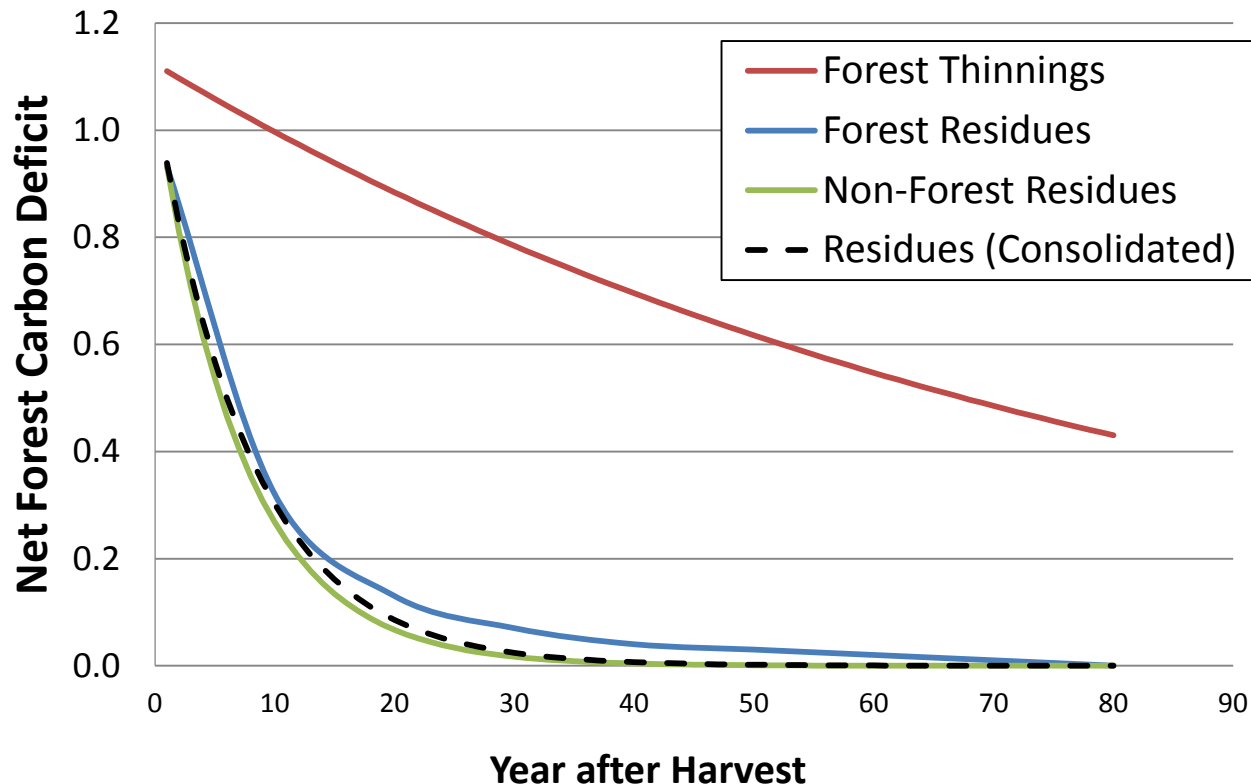
- *Guideline* provides spreadsheet for demonstrating GHG threshold for RPS Application, and for Annual Compliance Reporting
- Accounting is based on:
 - Overall Efficiency
 - Displaced Fuels
 - Biomass Fuel Use: Thinnings and Residues



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GHG Analysis – Thinnings and Residues

Carbon Deficit Functions for Biomass Harvests
(normalized per unit of carbon removed)



Thinnings: Long deficit reduction period during forest re-sequestration.

Residues: Short deficit reduction period due to avoided biomass decomposition.

Analyses based on Manomet Study (thinnings) and literature (residues). See *GHG Analysis Guideline*.

Fuel Certificates and Registry

Biomass Fuel Certificates

- One per ton of Eligible Biomass Fuel
- Forest Derived Biomass: Generated in Forester's *Biomass Tonnage Report*
- Non-Forest Derived Biomass: Generated by fuel provider
- Specifies fuel source as Thinnings or Residues
- All Certificates uploaded to Biomass Certificate Registry

Co-Mingled Biomass Woody Fuel

- Any woody biomass fuel that is physically co-mingled with Eligible Biomass Woody Fuel (e.g. at a fuel aggregation facility)

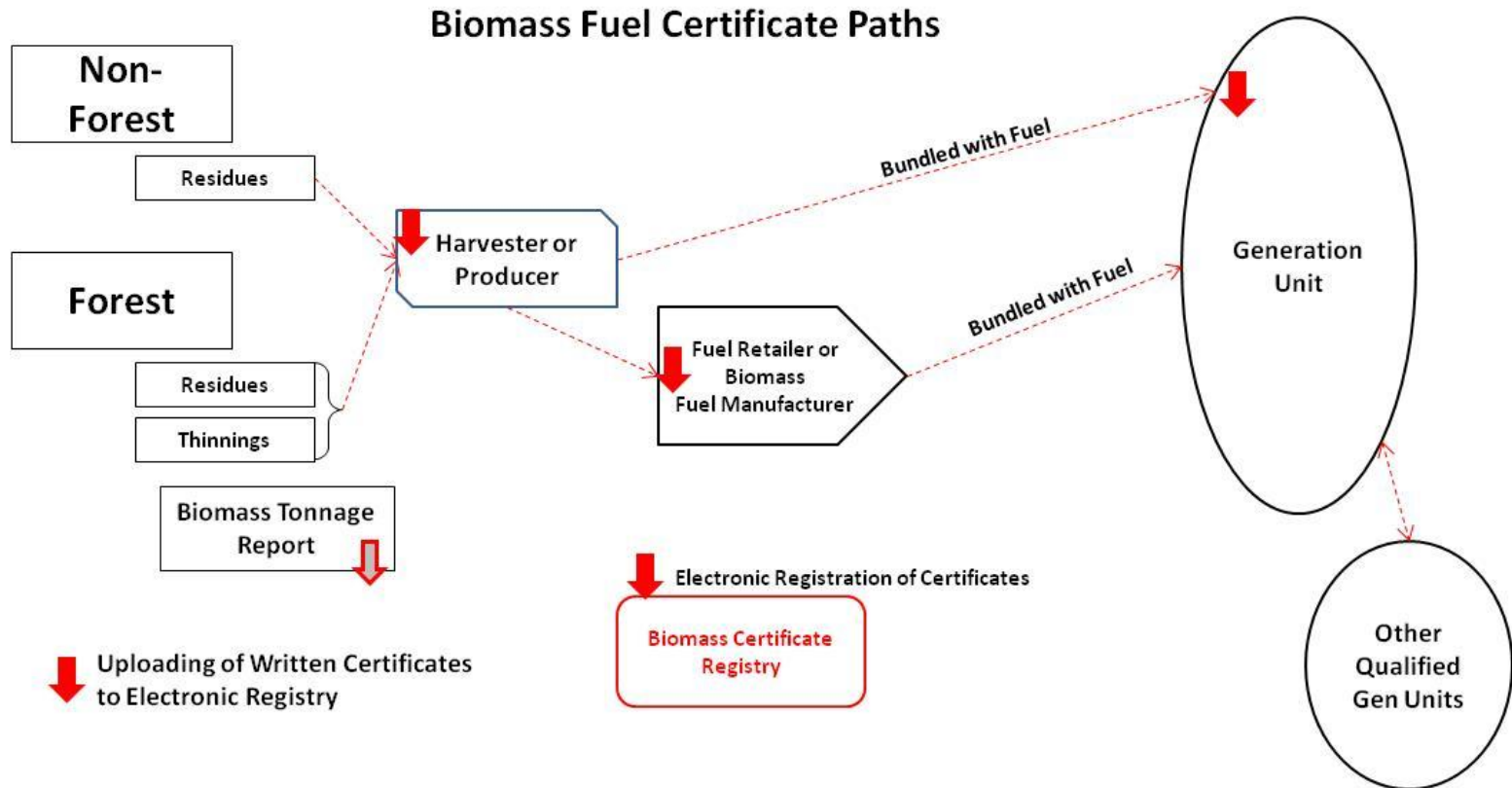
Certificate Pathways

- Directly from source to Unit, without mixing (bundled with fuel).
- From source to fuel retailer, and accompanying a delivery of Co-Mingled Biomass Woody Fuel directly to Unit (bundled with fuel).
- Trading of Certificates between qualified Units.



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Fuel Certificate Paths and Registry



Biomass Certificate Registry

- Electronic Registry, to be established by DOER
- Tracks Certificates from Source to Generator
- Limited Use and Trading
- Certificate Volume (Thinnings and Residues) basis for Annual Compliance



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Under Compliance Mechanism

Generation Unit Annual Compliance Report

- Annual report to DOER providing Unit's Overall Efficiency and GHG reductions relative to 50% reduction in 20 years threshold.
- Calculation methodology and reporting per *Guideline*

Under-Compliance

- Unit that demonstrates a reduction in 20 years of GHG less than 50% are deemed to be in Under-Compliance.
- Percentage points below the 50% threshold is the Percent Under-Compliance

Under-Compliance Mechanism

- Unit pays Under-Compliance Payment equal to \$0.50 times the Percent Under-Compliance for each REC settled for compliance in MA.
 - Fees paid to MassCEC and used as directed by DOER for residue fuel supply infrastructure and tree planting
- Unit enters Probationary Status for 5 years
 - Increasingly rigorous steps to assure compliance
 - Sustained compliance waives probationary status

Treatment of Previously Qualified Units

- All Units maintain qualification through 2012
- Units maintain qualification through 2014 if they provide DOER a Fuel Supply Plan and utilize Eligible Biomass Woody Fuel as demonstrated through ownership of Biomass Fuel Certificates.
- Beginning in 2016, all Units must meet the Overall Efficiency, GHG reduction threshold, and all provisions of the regulation.

Program Verification and Review

Advisory Panel

- Membership: EEA, DOER, DCR, DEP, and 5 non-government entities
- Meet not less than twice per year
- Provide findings and recommendations to DOER regarding confidence in verification and enforcement of:
 - Tracking/enforcement of *Eligible* and *Co-Mingled Biomass Woody Fuel*
 - Operations of the electronic tracking of Biomass Fuel Certificates and impact on fuel markets

Forest Impact Assessment

- DOER, in coordination with DCR, will assess the impact on forests resulting from biomass fuel removals, every five years, starting in 2015.
- Assessment will also survey aggregate fuel use by sources, and evaluate appropriateness and accuracy of GHG accounting methodologies.



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